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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/531,952

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EXAMINER

LACLAIR, DARCY D

ART UNIT

PAPER NUMBER

1796

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DELIVERY MODE

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PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/531,952	<b>Applicant(s)</b> TANAKA ET AL.	
	<b>Examiner</b> Darcy D. LaClair	<b>Art Unit</b> 1796	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 04 June 2010.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-15 is/are pending in the application.
- 4a) Of the above claim(s) 1 and 9-14 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 2-8 and 15 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |   |   |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                    | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)         | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                          |

### DETAILED ACTION

1. All outstanding rejections, except for those maintained below are withdrawn in light of the amendment filed on **6/4/2010**.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

The new grounds of rejection set forth below are necessitated by applicant's amendment filed on **6/4/2010**. In particular, **new Claim 15** has been added, reciting component (C) has a content of 20% mass to 30% mass in the composition. This limitation was not present in the claims at the time of the preceding Office Action. The examples in the specification show two polymers meeting the requirements of (C) present in 20, 25, and 30 mass parts of the resin, and thus the amendment is supported. Thus, the following action is properly made **FINAL**.

### ***Claim Rejections - 35 USC § 103***

2. **Claims 2 and 7-8** are rejected under 35 U.S.C. 103(a) as being unpatentable over **McCarthy et al. (US 5,883,199)** in view of **Liu et al. (J. of Environmental Polymer Design, 1997)**, **Hiruma et al. (JP 2002-128918)** and **Hodson (US 2006/0240726)**.

The rejection is adequately set forth in **paragraph 2** of the office action mailed **2/5/2010**, and is incorporated here by reference.

It is noted that the reference **Hodson (US 2006/0240726)** is used to show a universal fact, namely the characteristics and properties of a material, and therefore need not be available as prior art before applicant's filing date. See MPEP 2124.

**With respect to new Claim 15**, McCarthy teaches biodegradable blends including polylactic acid based polymer and one or more polyester polymers. (See abstract) The presence of the aliphatic polyester in more than 20% weight of the gives improvements in elongation toughness, and biodegradation rate. (See col 4 line 52-67) Furthermore, Liu indicates that there is no melting peak detected until the content of Bionolle, an aliphatic polyester, reached 20% by weight, suggesting that it should be employed at or above this level. (See p. 231 col 2) Therefore it would be obvious to one of ordinary skill in the art to employ the aliphatic polyester at a content of 20% or greater.

3. **Claims 4-5** are rejected under 35 U.S.C. 103(a) as being unpatentable over **McCarthy et al. (US 5,883,199)** in view of **Liu et al. (J. of Environmental Polymer Design, 1997)**, **Hiruma et al. (JP 2002-128918)** and **Hodson (US 2006/0240726)**, further in view of **Downie et al. (US 2001/0027225)**

The rejection is adequately set forth in **paragraph 3** of the office action mailed **2/5/2010**, and is incorporated here by reference.

4. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over **McCarthy et al. (US 5,883,199)** in view of **Liu et al. (J. of Environmental Polymer**

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**Design, 1997), Hiruma et al. (JP 2002-128918) and Hodson (US 2006/0240726),**  
further in view of **Akao et al. (US 5,814,497)**

The rejection is adequately set forth in **paragraph 4** of the office action mailed **2/5/2010**, and is incorporated here by reference.

5. **Claims 3 and 8** are rejected under 35 U.S.C. 103(a) as being unpatentable over **McCarthy et al. (US 5,883,199)** in view of **Liu et al. (J. of Environmental Polymer Design, 1997), Hiruma et al. (JP 2002-128918) and Hodson (US 2006/0240726),** further in view of **Obuchi et al. (US 6,916,950) and Wypych (2000)**

The rejection is adequately set forth in **paragraph 5** of the office action mailed **2/5/2010**, and is incorporated here by reference.

### ***Response to Arguments***

6. Applicant's arguments filed **6/4/2010** have been fully considered. Specifically, applicant argues

**(A)** The rejection of Claims 2-8 are traversed on the grounds that McCarthy does not disclose or suggest component (B) of Claim 2. Although McCarthy discloses a polymer of the Bionolle series, but there is no disclosure of an aromatic-aliphatic polyester or an aliphatic polyester having the properties as recited. The present specification states that aliphatic polyesters such as Bionolle series have a heat of crystal melting ( $\Delta H_m$ ) of more than 30 J/g. In other words, Biomolle does **not** meet the limitations of component (B) in Claim 2. The examiner has pointed out that the Bionolle

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#3000 series can be used as a compatibilizer in McCarthy, however Bionolle #3000 series has  $\Delta H_m$  of 44.9 J/g (3001), 43.0 J/g (3003), 34.8 J/g (3010) and 54.0 J/g (3030). Hiruma is cited as disclosing component (B) of Claim 2, however Hiruma discloses only a two-component system (PLA and one aromatic-aliphatic polyester) and there is no suggestion to add a third component, particularly not component (C). As Hiruma is specifically a heat-shrinkable film, adding an additional component would be expected to interfere with heat-shrink properties.

(B) With regard to New Claim 15, this further limits the content of component (C) to a lower limit of 20% mass. Support is found in Example I-5 on page 42. The arguments above are applicable to new Claim 15 as it depends from Claim 2, and additionally, the compatibilizer of McCarthy, cited as corresponding to component C, is present at only up to 10%.

7. **With respect to argument (A)**, applicant's arguments have been considered but are **not persuasive**. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986). When taken in combination, McCarthy, Liu, Hodson and Hiruma do teach the required elements. Specifically, McCarthy teaches biodegradable blends including polylactic acid based polymer and one or more polyester polymers, where the first and second polymers are present in a ratio of 9:1 to 1:9. (See abstract)

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The polylactic acid is at least 50 percent by weight, (see col 2 line 34-36) and blends with more than 20% weight of the aliphatic polyester have improvements in elongation toughness, and biodegradation rate. (See col 4 line 52-67) The second polymer is an aliphatic polyester such as polybutylenesuccinate-adipate copolymer, *inter alia*, and can contain a copolyester of an aliphatic polyester having up to 50% by weight of an aromatic polyester, such as terephthalate. (See col 2 line 37-45, col 6 line 5-12) Furthermore, McCarthy specifically exemplifies blends having polylactic acid and two polyesters. (See col 9, line 37-50) This accounts for both an aliphatic and an aliphatic-aromatic polyester. McCarthy does not explicitly detail the  $T_g$  or  $\Delta H_m$  of the other polyesters, Bionolle polymers, such as 1000, 2000, 3000, 6000, and 7000 series. Hodson provides evidence as to the glass transition temperatures of Bionelle: 1001 has  $T_g$  of  $-30^{\circ}\text{C}$ , 3001 has  $T_g$  of  $-35^{\circ}\text{C}$ , and 6001 has  $T_g$  of  $-4^{\circ}\text{C}$ . Furthermore, as applicant helpfully demonstrates, Bionolle polymers meet the requirements of both the (C) component (Bionolle 3030, having a  $\Delta H_m$  of 54.0 J/g), as well as the (B) component as taught and demonstrated by McCarthy and Hodson, respectively, as discussed above. Liu teaches that Bionolle is beneficially blended with PLA to improve the thermal and mechanical properties of the PLA (see abstract) and to provide good processability, physical properties, and resistance to water and solvents. (See p. 225 col 2) The Bionolle is used from 0 to 50% by weight (see p. 232 Table I) and Liu indicates that there is no melting peak detected until the content of Bionolle reached 20% by weight, suggesting that it should be employed at or above this level. (See p. 231 col 2) The preferred Bionolle for use in the PLA is 1001 and 3010. Bionolle 1001 has  $\Delta H_m$  of 58.0

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J/g. This is consistent with the (C) component of applicant's claims. McCarthy teaches that the second polyester polymer portion of the blend can contain, in addition to the aliphatic polyester, a copolyester of an aliphatic polyester having up to 50% by weight of an aromatic polyester, such as terephthalate. (See col 2 line 37-45, col 6 line 5-12) Hiruma teaches a polylactic acid-type polymer composition having an aromatic-aliphatic polyester resin component. (See par [0003]) This inclusion improves shock resistance (see par [0002]) and the aromatic aliphatic polyester of Hiruma is suitably biodegradable even with the aromatic component. (See par [0009]) Hiruma specifically exemplifies Ecoflex, an aromatic aliphatic polyester. (See par [0018]) Ecoflex is used by applicant, and has a  $\Delta H_m$  of 21.6 J/g and  $T_g$  less than 0°C. This component is consistent with applicants (B) polyester. Given the teachings of McCarthy in combination with Liu and Hiruma, it would be obvious to combine a polylactic acid polymer with two or more polyesters, and to use both an aliphatic polyester and an aliphatic-aromatic polyester as those polyesters.

**With respect to argument (B)**, applicant's arguments have been considered but are **not persuasive**. Attention is directed to the discussion above with respect to Claim 15 and above with respect to argument (A). Furthermore, with regard to the (C) component which is consistent with the aliphatic polyester of McCarthy, McCarthy teaches that blends with more than 20% weight of the aliphatic polyester have improvements in elongation toughness, and biodegradation rate. (See col 4 line 52-67) Liu indicates that there is no melting peak detected until the content of Bionolle reached



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20% by weight, suggesting that it should be employed at or above this level. (See p. 231 col 2)

### ***Conclusion***

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Darcy D. LaClair whose telephone number is (571)270-5462. The examiner can normally be reached on Monday-Friday 8:30-6.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Milton Cano can be reached on 571-272-1398. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Milton I. Cano/  
Supervisory Patent Examiner, Art Unit 1796

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Examiner  
Art Unit 1796

/DDL/